

CLAIMS

What is claimed is:

- 1 1. A magnetic write element for perpendicular recording comprising:
2 a write pole, at least a portion of said write pole having a first and second lateral
3 sides defining a track width;
4 a trailing magnetic shield;
5 a write gap separating said magnetic trailing shield from said write pole; and
6 at least a portion of said trailing shield having a first and second lateral sides
7 laterally aligned with at least a portion of said first and second lateral sides of said write
8 pole.

- 1 2. A magnetic write element as set forth in claim 1, wherein said write pole has a
2 trapezoidal shape including a wide portion adjacent to said write gap and a narrower
3 portion distal from said write gap, and wherein said first and second lateral sides of said
4 magnetic trailing shield are substantially aligned with said widest portion of said write
5 pole..

- 1 3. A magnetic write element as in claim 1 wherein at least a portion of said magnetic
2 write pole is formed of laminated magnetic layers.

1 4. A magnetic write element as in claim 1 further comprising a magnetic return pole,
2 and wherein said alignment of said first and second sides of said magnetic shield with
3 said first and second sides of said write pole extends from said write gap to said return
4 pole.

1 5. A magnetic write element as in claim 1 wherein said magnetic shield includes a
2 first portion and a second portion, said first portion having said first and second sides in
3 substantial alignment with said first and second sides of said write pole, and wherein said
4 second portion of said shield has first and second sides extending laterally beyond said
5 first and second sides of said first portion.

1 6. A magnetic write element as in claim 5, wherein said shield has a throat height
2 dimension, and wherein said first portion of said shield has third and fourth sides that are
3 substantially aligned with a third and a fourth dimension of said second shield portion
4 along said throat height dimension.

1 7. A magnetic write element as in claim 1, wherein said write element is
2 incorporated onto a slider having a predetermined fly height and wherein said write gap is
3 less than said fly height.

1 8. A magnetic write element as in claim 1 wherein said magnetic write head has an
2 air bearing surface that is perpendicular to said first and second lateral sides of said

3 shield, and wherein said shield has a dimension, as measured from said air bearing
4 surface, that is substantially equal to half the distance between said first and second
5 lateral sides of said shield.

1 9. A magnetic write element as in claim 1 wherein said write head has an air bearing
2 surface and wherein said shield has a thickness as measured from said air bearing surface
3 that is less than a distance between said lateral sides of said shield.

1 10. A magnetic write element as in claim 1 wherein:
2 said write element has a surface defining an air bearing surface;
3 a width of said write pole defines a trackwidth; and
4 said shield has a thickness as measured from said air bearing surface that is less
5 than said trackwidth.

1 11. A magnetic write element as in claim 1 wherein:
2 said write element has a surface defining an air bearing surface;
3 a width of said write pole defines a trackwidth; and
4 said shield has a thickness as measured from said air bearing surface that is
5 substantially half of said trackwidth.

1 12. A method for constructing a write head for perpendicular magnetic recording,
2 comprising:
3 depositing a layer of write pole material;

4 depositing a non-magnetic write gap material over said write pole material;
5 forming a magnetic shield pedestal over said write gap material layer, said shield
6 pedestal having first and second lateral sides defining planes perpendicular to an air
7 bearing surface; and
8 performing a material removal process to remove selected portions of said write
9 gap layer and said write pole material using said shield pedestal as a mask to prevent
10 removal of said write gap material and said write pole material disposed beneath said
11 shield pedestal.

1 13. A method as in claim 12, wherein a distance between said first and second lateral
2 sides of said shield pole material defines a track width and wherein said shield pedestal
3 has a depth in a direction perpendicular to said air bearing surface that is less than said
4 track width.

1 14. A method as in claim 12, wherein a distance between said first and second lateral
2 sides of said shield pole material defines a track width and wherein said shield pedestal
3 has a depth in a direction perpendicular to said air bearing surface that is less than said
4 track width.

1 15. A method as in claim 12 wherein said material removal process comprises
2 reactive ion etching.

1 16. A method as in claim 12 wherein said material removal process comprises
2 reactive ion milling at an angle between 0 and 90 degrees with respect to at least one of
3 said lateral side walls of said shield pedestal.

1 17. A method as in claim 12 wherein said shield pedestal is constructed of a
2 laminated magnetic layers.

1 18. A method as in claim 12, further comprising:
2 depositing a magnetic main shield portion over said shield pedestal; and
3 performing a second material removal process, using said magnetic main shield
4 material as a mask to remove selected portions of said shield pedestal to define a throat
5 height of said shield pedestal, said throat height being a dimension measured from said
6 air bearing surface.

1 19. A method as in claim 18, wherein said second material removal process
2 comprises reactive ion etching.

1 20. A magnetic recording system, comprising:
2 a housing;

3 a magnetic medium movably held within said housing;

4 an actuator;

5 a slider connected with said actuator for movement relative to a surface of said

6 magnetic medium; and

7 a magnetic write element connected with said slider, and comprising:

8 a write pole, at least a portion of said write pole having a first and

9 second lateral sides defining a track width;

10 a trailing magnetic shield;

11 a write gap separating said magnetic trailing shield from said write

12 pole; and

13 at least a portion of said trailing shield having a first and second

14 lateral sides laterally aligned with at least a portion of said first and second

15 lateral sides of said write pole.